

Sexually Transmitted Identification

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Abstract: The Internet consistently has new tools for creating interpersonal connections. Some of these tools expedite the process of finding new sexual partners outside of one's current social network. These tools also decrease the usefulness of social methods for self-protection like reputation and hasten the spread of sexually transmitted infections ("STIs").

Sexually non-monogamous people need a way to make up for the loss of social methods to determine those who are more likely to have STIs. They could engage in more monogamy or consistently have safe sex, but these methods are not working today. Alternatively, a new system could increase the amount of sexual health data available to potential partners. Adding this technology to existing relationship and hookup websites offers an opportunity to protect people from contracting STIs.¹

This article discusses how a sexual health identification system with strong privacy measures, combined with existing relationship and hookup websites would increase sexual safety. Part II of this article describes the history of safe sex including existing morality-based solutions to protect people against the transmission of STIs. Part III describes the problem of internet hookup sites and identifies existing safe sex websites and improvements they need. Part IV describes relevant existing technologies in other fields and the privacy problems therein. Part V

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¹ Hookup websites are Internet sites with a primary focus of helping members find casual sexual partners for one night sexual encounters or short sexually focused relationships.

presents an idea for a successfully implementing a sexual health identification system that includes an advanced private key infrastructure and biometric identification linked to a secure database with recent STI results and reputation data for potential partners. Part VI describes how the widespread use of this technology could change the legal framework for torts involving the spread of STIs and the legal liability related to this identification system. Finally, Part VII shows how in comparison to the cost of treatment, this idea makes financial sense.

I. INTRODUCTION

The exponential rise of sexually transmitted infections (“STIs”)² makes learning about the STI status of potential sexual partners a critical component of having a long-lasting and healthy sex life.³ According to the Centers for Disease Control (“CDC”), in 2008, there were over 45 million total cases of herpes,⁴ 1,210,523 new cases of chlamydia, 336,742 new cases of gonorrhea, over 46,000 total cases of syphilis,⁵ and over 56,000 new HIV infections in the United States alone.⁶ In addition, the Journal of the American Medical Association (“JAMA”) estimates that half of all American women have the human papillomavirus.⁷

² Some medical professionals refer to Sexually Transmitted Infections as Sexually Transmitted Diseases; this article refers to them as STIs although in this article it is interchangeable with STDs.

³ *One In Four Teenage Girls in U.S. Has Sexually Transmitted Disease, CDC Study Shows*, SCIENCEAILY.COM, March 12, 2008, <http://www.sciencedaily.com/releases/2008/03/080312084645.htm>.

⁴ Centers for Disease Control and Prevention, *Genital Herpes – CDC Fact Sheet*, Jan. 4, 2008, <http://www.cdc.gov/std/herpes/STDFact-herpes.htm>.

⁵ Centers for Disease Control and Prevention, *Sexually Transmitted Disease Surveillance 2008*, 1-3, 31-33 (Nov. 2009), available at <http://www.cdc.gov/std/stats08/surv2008-Complete.pdf>.

⁶ Centers for Disease Control and Prevention, *HIV Incidence*, Sep. 11, 2008, <http://www.cdc.gov/hiv/topics/surveillance/incidence.htm>.

⁷ Elizabeth Cohen, *Rising STD rates sparks online dating sites*, CNN.COM, March 12, 2007, <http://www.cnn.com/2007/HEALTH/conditions/02/27/std.internet/index.html>.

STI transmissions are increasing after a decline during the 1980's and early 1990's.⁸ Some believe this resurgence is due to better treatments for the diseases; others believe that the Internet may be a key factor behind this rise.⁹ Research connecting the Internet to STI transmission is still limited. However, a JAMA study shows that Internet sex seekers "reported more previous ST[I]s; more partners; more anal sex . . . and [more] partners known to be HIV positive than those not seeking sex via the Internet."¹⁰ A 2006 CDC study expands on this and shows that compared with men who have sex with men who meet offline initially; those who meet online initially are less likely to practice safe sex.¹¹ While online sex seekers use protection less often, websites such as AdultFriendFinder.com and Manhunt.net are making it easier to have sex with new, previously unknown partners.¹² The proliferation of places to find sex online is also leading to a rapid rise in sex addiction.¹³

The expansion of easily accessible casual sex does not need to mean that STI transmission must also rise. When used properly, condoms have over a 99% efficacy rate, but condoms may slip or break up to 12% of the time.¹⁴ Condom slippage and breakage is most common among the highest risk communities,¹⁵ which means that a strategy encouraging condom use alone will not solve the problem.

⁸ Centers for Disease Control and Prevention, *STD Increases among Gay and Bisexual Men Reported at National Conference*, Dec. 5, 2000, Updated June 1, 2003, <http://www.cdc.gov/stdconference/2000/media/stdgay2000.htm>.

⁹ *Id.*

¹⁰ Mary McFarlane, Sheana S. Bull & Cornelis A. Rietmeijer, *The Internet as a Newly Emerging Risk Environment for Sexually Transmitted Diseases*, 284 JAMA, 443, 443-446 (2000), available at <http://jama.ama-assn.org/cgi/content/full/284/4/443>.

¹¹ Adrian Liau et al., *Meta-analytic examination of online sex seeking and sexual risk behavior among men who have sex with men*, 33 SEXUALLY TRANSMITTED DISEASES, 576-84 (Sept. 2006).

¹² See www.adultfriendfinder.com, www.manhunt.net.

¹³ *Internet-led increase in male sex addiction*, MEN'S HEALTH FORUM, Jan. 21, 2008, http://www.menshealthforum.org.uk/userpage1.cfm?item_id=2333.

¹⁴ Family Health International, *Breakage and Slippage of Male Condoms: What Do We Know?* 2009, <http://www.fhi.org/en/RH/Pubs/factsheets/breakslip.htm>.

¹⁵ William R. Grady & Koray Tanfer, *Condom breakage and slippage among men in the United States*, 26 FAMILY PLANNING PERSPECTIVES, 107-12 (May-June 1994).

Relying on new sexual partners to discuss each other's STI status is also ineffective because it relies on trusting a potential partners' word about their status. Their word is only useful if people get STI tests frequently and are not afraid to ask or to disclose their own status.¹⁶ This is just one reason why, in an age with more semi-anonymous, casual sex, a STI identification and verification system will be a critical component of sexual health that other traditional safe sex techniques cannot provide.

II. STI HISTORY AND THE FAILURE OF SUSTAINED REDUCTION

STIs are not a new problem. Syphilis was common in Sweden as early as 1497.¹⁷ Before penicillin, syphilis and gonorrhea were widespread STIs.¹⁸ The issue gained some public attention in the United States during World War I when many U.S. soldiers became sick from these diseases.¹⁹ The military had varying programs to address these issues ranging from isolation, to providing alternative activities to alcohol and sex.²⁰

Like soldiers, men who had sex with men also had a high rate of STIs because the biology of male homosexual sex makes it easier to spread infections.²¹ This was in addition to a culture of casual sex, highlighted by the popularity of bathhouses in the 1960's and 1970's,

¹⁶ Danielle C. Newton & Marita P. McCabe, *Sexually Transmitted Infections: Impact on Individuals and Their Relationships*, 13 *Journal of Health Psychology*, 864-869 (2008).

¹⁷ Stig Cronberg, *The Rise and Fall of Sexually Transmitted diseases in Sweden*, 69 *Genitourin Med.*, 184-6 (June 1993), available at <http://www.ncbi.nlm.nih.gov/pubmed/8335310>.

¹⁸ Allan M. Brandt, *No Magic Bullet: A Social History of Venereal Disease in the United States since 1880*. Expanded ed. New York: Oxford University Press (1987), available at <http://www.faqs.org/childhood/Th-W/Venereal-Disease.html>.

¹⁹ KENNETH H. MAYER & HANK PIZER, *THE AIDS PANDEMIC: IMPACT ON SCIENCE AND SOCIETY*, 112-113 (2005), available at <http://books.google.com/books?id=fSui9GabxrUC&lpg=PT11&ots=dFMqacchAx&dq=hank%20pizer%20the%20aids%20pandemic&pg=PT134#v=onepage&q=World%20War&f=false>.

²⁰ *Id.*

²¹ *Different HIV Rates Among Gay Men and Straight People Not Fully Explained by Sexual Behavior*, *SCIENCE DAILY*, Sept. 14, 2007, <http://www.sciencedaily.com/releases/2007/09/070913132930.htm>.

where it was common to have unsafe sex with multiple partners.²² This biological disadvantage paired with unsafe sex was devastating to the homosexual community when HIV came to the United States.²³

After the HIV epidemic struck in the early 1980's, safe-sex techniques became much more widely practiced including: abstinence, condom use, reducing the number of sexual partners, and treatment after an exposure to an STI.²⁴ Then, during the mid-1990's, more effective medications led to a decline in HIV related deaths.²⁵ This decline may explain the recent resurgence in unsafe sex and increase in transmission of HIV,²⁶ because in the early phase of the HIV epidemic, those in the highest risk communities frequently saw friends die from HIV.²⁷ Whereas today, fewer trademark signs of the disease and longer life spans have made the dangers of HIV less visible.²⁸

²² Richard Coliss, *Bette Midler Takes Vegas, Leaves Bathhouse*, TIME, Feb. 29, 2008, available at <http://www.time.com/time/arts/article/0,8599,1718624,00.html>.

²³ The discussion of HIV in this paper is meant to include those HIV cases that result in AIDS, HIV is used instead of HIV/AIDS for ease of reading. This application is also useful for other STDs as well. The application of the system will focus on how it relates to HIV, but is equally applicable to all STIs for which a person can receive a test.

²⁴ *The origin of AIDS and HIV and the first cases of AIDS*, AVERT, Dec. 23, 2009, <http://www.avert.org/origin-aids-hiv.htm>.

²⁵ *Study: HIV Mortality Rates Continue to Drop as Treatments Improve*, July 1, 2008, http://www.pbs.org/newshour/updates/science/july-deco8/hivmortality_07-01.html; Michael Carter, *Safer sex fatigue and HAART optimism explain rise in US bareback sex*, March 22, 2002, <http://www.aidsmap.com/en/news/C5F1449B-BE3C-4C9E-BF97-2CECDFC5815E.asp>.

²⁶ Maxine Frith, *High-risk sex lives: HIV on the rise again*, THE INDEPENDENT, Nov. 25, 2006, available at <http://www.independent.co.uk/life-style/health-and-families/health-news/highrisk-sex-lives-hiv-on-the-rise-again-425714.html>.

²⁷ Molly Hennessy-Fiske, *Town hall focuses on L.A.'s battle with HIV/AIDS*, LA Times, Oct. 16, 2009, available at <http://www.latimes.com/news/local/la-me-aids-study16-2009oct16,0,809470.story?page=2>.

²⁸ B.R. Simon Rosser, William West & Richard Weinmeyere, *Are Gay Communities Dying or Just in Transition? Results from an International Consultation Examining Structural Change in Gay Communities*, 20 AIDS Care, 588–595 (May 2008), available at <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2562784/>; *US AIDS deaths decreasing*, PUBLIC AGENDA, April 2008, <http://www.publicagenda.org/charts/us-aids-deaths-decreasing>.

B. MORALITY BASED STI REDUCTION EFFORTS HAVE BEEN INEFFECTIVE

No matter what the scientific studies say, there remains a widespread morality-based discontent with any policy to increase safe sex. Many believe that abstinence until marriage and monogamy thereafter is the only choice.²⁹ Abstinence has long been the policy of many churches and was the policy of the Bush Administration.³⁰ Yet, its failure is evident as the United States has the highest teen pregnancy rate of any developed country.³¹

Some have proposed gay marriage bans as a way to decrease HIV transmission.³² This approach has proven ineffective, as at least one study has tied gay marriage bans in a state to an increased risk of contracting HIV.³³ The marginalization of the gay community only increases reliance of many gays upon the internet and anonymous partners, which consequently increases the levels of HIV transmission.³⁴

There are several other examples of ineffective morality-based policies to stem the spread of STIs. One is the Catholic Church's anti-condom policy.³⁵ Another is laws that intend to decrease HIV transmission, like a law in Georgia that made it a felony to engage in sexual behavior without disclosing one's status if someone is

²⁹ See Ted McDonough, *Birds, Bees and STDs*, SALT LAKE CITY WEEKLY, June 17, 2009, available at <http://www.cityweekly.net/utah/article-8277-birds-bees-and-stds.html>.

³⁰ Sharon Jayson, *Abstinence Message Goes Beyond Teens*, USA TODAY, Oct. 31, 2006, available at http://www.usatoday.com/news/washington/2006-10-30-abstinence-message_x.htm.

³¹ *Teen Pregnancy Rates in the USA*, Nov. 18, 2009, <http://www.livestrong.com/article/12504-teen-pregnancy-rates-usa>.

³² *Gay Marriage Bans Linked to Rise in HIV Rate*, SCIENCEDAILY.COM, June 7, 2009, <http://www.sciencedaily.com/releases/2009/06/090605171435.htm>.

³³ *Id.*

³⁴ Rashmi Gangamma et al., *Comparison of HIV Risks among Gay, Lesbian, Bisexual and Heterosexual Homeless Youth*, 37 J Youth Adolesc. 456–464 (2008), available at <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2443720>.

³⁵ AFP, *Pope Benedict visits Africa; reaffirms anti-condom policy*, March 17, 2009, <http://www.france24.com/en/20090317-pope-benedict-kicks-off-african-mission-cameroon-angola-tour>.

knowingly HIV positive.³⁶ Yet, this law does not have the same penalty if a person is not aware of his or her HIV status and later discovers that he or she infected another person.³⁷ This results in an incentive to avoid testing and may actually cause HIV transmission rates to rise. Another policy is not vaccinating children against certain STIs because some believe that vaccination may encourage premarital and unsafe sexual behavior.³⁸ The failure of these morality-based solutions to stop the spread of HIV further stresses the need for a better system to help people prevent unnecessary risks of HIV transmission.

III. THE INTERNET'S ROLE IN STI TRANSMISSION

A. INTERNET HOOKUPS ARE RISKY AND POPULAR

Hookup sites are some of the most visited on the Internet. With about 28 million visitors a month, Adultfriendfinder.com is one of the top 100 visited websites in English on the Internet.³⁹ In comparison, cnn.com has around 26 million.⁴⁰ Catering to the gay community, Adam4adam.com and manhunt.net each have over 400,000 unique visitors a month and gay.com has over 828,000.⁴¹

The level of membership on these sites has already changed how first sexual partners are found. A study in England showed that 61%

³⁶ Sciencedaily.com, *supra* note 32.

³⁷ *Id.*

³⁸ Danielle Kim, *FDA approves HPV vaccine despite conservative protest*, THE PALLY VOICE, Nov. 13, 2006, http://voice.paly.net/view_story.php?id=4717; Rob Stein, *Debate Rages on Use of Cervical Cancer Vaccine*, WASHINGTON POST, Oct. 31, 2005, available at <http://www.sfgate.com/cgi-bin/article.cgi?file=/c/a/2005/10/31/MNG2LFGJFT1.DTL>.

³⁹ Alexa, *adultfriendfinder.com*, http://www.alexa.com/data/details/traffic_details/adultfriendfinder.com?compare_sites=&q=&range=6m&size=medium&y=t (last visited April 8, 2010); Quantcast, *adultfriendfinder.com*, <http://www.quantcast.com/adultfriendfinder.com> (last visited April 8, 2010).

⁴⁰ Quantcast, *cnn.com*, <http://www.quantcast.com/cnn.com> (last visited April 8, 2010).

⁴¹ Quantcast, *adam4adam.com*, <http://www.quantcast.com/adam4adam.com> (last visited April 8, 2010); Quantcast, *manhunt.net*, <http://www.quantcast.com/manhunt.net> (last visited April 8, 2010); Quantcast, *gay.com*, <http://www.quantcast.com/gay.com> (last visited April 8, 2010).

of gay men find their first sexual partner online, and sociologists believe the same is probably true in America.⁴² Meeting sexual partners online is increasingly popular among heterosexuals as well. A 2000 study showed that of heterosexuals who met a sex partner online, they met an average of seven sexual partners that way in the past year alone.⁴³

While there is an increase in meeting sexual partners online, infrequent HIV testing makes the problem of trust more prevalent.⁴⁴ A European Journal of Public Health study in England showed that 25% of men who had sex with men were telling their partners that they were HIV negative, without ever being tested.⁴⁵ An American Journal of Public Health study in the United States showed that among HIV-positive gay men, 42% had unprotected sex without telling their partner of their status, and the majority of these experiences were with non-exclusive partners.⁴⁶

Deception may be even more prevalent as many sites like manhunt.net provide a location for an unverified listing of one's HIV status. The ability to filter results by HIV status provides an incentive to lie about one's status in order to remain in the search results. A related study by Gene Robinson of the University of California at Los Angeles showed how race dramatically affects the amount of contacts

⁴² Michael Joseph Gross, *Has Manhunt Destroyed Gay Culture?* Out, <http://www.out.com/detail.asp?id=24005> (last visited April 8, 2010).

⁴³ D. Hollander, *Among young adults, use of the internet to find sexual partners is rising* – Digests, 34 PERSPECTIVES ON SEXUAL AND REPRODUCTIVE HEALTH 318-19 (Nov.-Dec. 2002), available at <http://www.guttmacher.org/pubs/journals/3431702.pdf>.

⁴⁴ D. Hollander, *Frequency of HIV testing is suboptimal among some men who are high at risk*, 38 PERSPECTIVES ON SEXUAL AND REPRODUCTIVE HEALTH 170-71, Sep. 1, 2006, available at <http://www.thefreelibrary.com/Frequency+of+HIV+testing+is+suboptimal+among+some+men+who+are+at+high+...-a0152179182>.

⁴⁵ Anthony Nardone, James S. Frankis, Julie P. Dodds, Paul N. Flowers, Danielle E. Mercey & Graham J. Hart, *A Comparison of high-risk sexual behaviour and HIV testing amongst a bar-going sample of homosexual men in London and Edinburgh*, 11 EUROPEAN JOURNAL OF PUBLIC HEALTH, 185-189 (2001), available at <http://eurpub.oxfordjournals.org/cgi/reprint/11/2/185.pdf>.

⁴⁶ D.H. Ciccarone, D.E. Kanouse & R.L. Collins, *Sex without disclosure of positive HIV serostatus in a U.S. probability sample of persons receiving medical care for HIV infection*, AMERICAN JOURNAL OF PUBLIC HEALTH, June 2003, at 949-954, available at <http://ajph.aphapublications.org/cgi/content/full/93/6/949>.

on a hookup website for a person.⁴⁷ This decrease in contacts may also occur for those who list a HIV-positive status.

Unverified HIV listings in profiles may also increase racially discriminatory searching because of the substantially higher incidence of HIV in the black community. Blacks have 47% of the HIV infections in America even though they are only 13% of the population.⁴⁸ Reliable HIV result verification may decrease the stereotyping that is the result of this imbalance.

Incentives to lie about one's history may be especially strong among certain harder to identify communities. One such community is former prisoners because they account for 25% of HIV infected Americans.⁴⁹ Another such community are "straight" males who have sex with women, but also with men. One study shows that while these men might be using protection when they have sex with other men, they are up to three times as likely to then have unprotected sex with a female.⁵⁰ This can greatly increase the risks for the women who have sex with these men, as the men are likely to withhold their full sexual history.⁵¹ These examples of communities with incentives to cover important parts of a person's relevant sexual history, demonstrate the need for a HIV identification and verification system.

⁴⁷ Russell K. Robinson, *Structural Dimensions of Romantic Preferences*, 76 FORDHAM L. REV. 2787, 2809-2819, available at <http://law2.fordham.edu/publications/articles/500flspub13012.pdf>.

⁴⁸ Centers for Disease Control, *CDC Basic Statistics*, Feb. 26, 2009, <http://www.cdc.gov/HIV/topics/surveillance/basic.htm#aidscauses>; *Condoms urged in prisons to curb AIDS*, MSNBC, Nov. 16, 2006, <http://www.msnbc.msn.com/id/15753803>.

⁴⁹ Paul Sanchez, Center for Health Justice, *AB 1334: Inmate and Community Public Health and Safety Act*, 8, <http://www.bienestar.org/Leg%20Briefing%20Documents/AB1334%20Condoms%20in%20Prisons.pdf> (last visited April 8, 2010).

⁵⁰ Cheryl Wold, George R. Seage III, William R. Lenderking, Kenneth Mayer, Bin Cai, Timothy Heeren & Robert Goldstein, *Unsafe Sex in Men who have Sex with Both Men and Women*, 17 JOURNAL OF ACQUIRED IMMUNE DEFICIENCY SYNDROMES, 361-367 (April 1, 1998), available at http://journals.lww.com/jaids/Fulltext/1998/04010/Unsafe_Sex_in_Men_Who_Have_Sex_With_Both_Men_and.11.aspx; see also I-Ching Ng, *Helping the Hidden Community of HIV*, TIME, Aug 19, 2008, available at <http://www.time.com/time/health/article/0,8599,1833962,00.html>.

⁵¹ *Id.*

B. SITES AVAILABLE TODAY MUST DO BETTER

A handful of start-up websites have attempted to address the need for HIV verification. However, none of the major dating websites have adopted these safer sex technologies. Checktonight.com, which has since become defunct, was a personal ad site that loaded negative HIV test results sent from doctors into a database for their members.⁵² The site only displayed users with negative results and the site removed HIV positive users to protect their privacy.⁵³ This caused a problem because it excluded those who tested HIV positive from the system. Therefore, if people saw a profile and it suddenly disappeared, someone might just have deleted it, but another user could assume that person was HIV positive. Thus, the system was suboptimal.

Safe sexpassport.com uses a more secure method for HIV verification. A user purchases a card and sets a unique security code, they are tested, and then the results are loaded into a database.⁵⁴ Next, to check the results, a person gives their card to a potential partner who enters the ID number from the front of the card, and the person who gave the card tells the potential sexual partner their personal password.⁵⁵ At this point, the system tells the person the first three digits of a previously registered photo ID and the person can check the other person's photo ID to verify the identity.⁵⁶ Finally, every six months the card no longer works until someone gets a new test.⁵⁷

The Safe Sex Passport is a promising approach, but has several drawbacks. First, the ID system uses a numeric password to unlock the results. This can allow for replication of results until the password

⁵² *The New Frontier of Social Networking* (NBC4 television broadcast March 8, 2007), available at http://www.youtube.com/watch?v=4Hrgalhyso&feature=channel_page; *Website verifies STD-free sex partners*, CANADA.COM, May 20, 2008, <http://www.canada.com/topics/bodyandhealth/story.html?id=c1b64045-de25-47cf-ab83-dc840356093c>.

⁵³ *Id.*

⁵⁴ SSP BioAnalytics, *How the Safe Sex Passport System Works*, <http://www.safesexpassport.com/pr/prhowworks.htm> (last visited April 8, 2010).

⁵⁵ *Id.*

⁵⁶ *Id.*

⁵⁷ *Id.*

is changed. For instance, someone could memorize the identifying information of a person that they shared results with, and then access that later to share those results with unintended viewers. A more secure system would constantly change this variable so that the results would be viewable one time only and could not be retrieved again using the same password, but this would be complicated to use, and may lead to people not using the system. An analogy would be instances in which individuals still have sex even if they forgot a condom.⁵⁸ A solution to this problem would be to use biometric data, so that people could not swap cards with someone they resemble and it would be easier to use.

A second drawback is for users who want anonymity. They would not use this system because of the need to get one of these cards with their photograph on it. When an individual places the card in his or her wallet, for example, it could raise suspicions from a partner. The ideal system would have a better option for anonymity, but could still identify people accurately.

IV. EXISTING IDENTIFICATION SYSTEMS AND SOLUTIONS USING THEM

A. SYSTEMS TO IDENTIFY THE PERSON DIRECTLY

Several countries have implemented identification systems that are instructive for the design of an STI verification system. A method of verifying participants' identities could be similar to the system for submitting identification documents and photos used for passports.⁵⁹ Although the passport process is secure, it is still vulnerable to fraud. For example, a recent Homeland Security study demonstrated the threat of fraud when the Department tested its system and was able to secure genuine U.S. Passports by submitting forged documents.⁶⁰

⁵⁸ *Botswana: A Risky Combination of Alcohol and Sex*, PLUSNEWS.COM, Nov. 5, 2009, <http://www.plusnews.org/Report.aspx?ReportId=86899>.

⁵⁹ Passports require the attachment of two photographs, primary evidence of U.S. Citizenship and primary identification. U.S. Dep't. of State, *How to Apply in Person*, http://travel.state.gov/passport/get/first/first_830.html (last visited April 8, 2010).

⁶⁰ U.S. GEN. ACCOUNTING OFFICE, BORDER SECURITY: SECURITY OF NEW PASSPORTS AND VISAS ENHANCED, BUT MORE NEEDS TO BE DONE TO PREVENT THEIR FRAUDULENT USE, GAO-01-1006, July 31, 2007, available at <http://www.gao.gov/products/GAO-07-1006>; National Terror Alert, *Homeland Security – Study Finds Serious Vulnerabilities in U.S. Passport Process*, March 16, 2009, <http://www.nationalterroralert.com/updates/2009/03/16/homeland-security-study-finds-serious-vulnerabilities-in-us-passport-process>.

Therefore, implementing a process like passport issuance will not guarantee authenticity. In addition, the cost of a passport, currently available at \$100, is cost-prohibitive for the most at risk populations.⁶¹

A stricter system, US-VISIT, uses finger scans and digital photos to track foreign nationals visiting the U.S.⁶² A similar system to US-VISIT could meet the needs of an STI verification system. Applicants could submit photos and use a fingerprint reader on a smart phone. In order to prove the correct identity, the system could display a person's picture in addition to requiring that person's fingerprint before releasing the result. The system would only make this information available for a short enough period to verify that the result belongs to a certain person.

Digital signatures are another type of identification technology that could be useful. Digital signatures use asymmetric cryptology, meaning the use of two separate keys.⁶³ A type of asymmetric cryptology is public key infrastructure ("PKI"), which is a system that makes one of the keys known publicly.⁶⁴ The next step is interaction with a certification authority, which is a trusted vender that distributes and verifies the legitimacy of the keys.⁶⁵ The sender has a private key known only to him to encrypt the message, and the recipient has a related public key to decrypt the message and verify whom it is from and that it is unaltered.⁶⁶ The certification authority then tells the recipient which public key to use to decode the message.⁶⁷ It is computationally infeasible to determine the private key from the public key and this makes public key technology very

⁶¹ U.S. Dep't. of State, *Passport Fees*, http://travel.state.gov/passport/get/fees/fees_837.html (last visited April 8, 2010).

⁶² U.S. Dep't. of Homeland Security, *US-VISIT What to Expect When Visiting the United States*, Nov. 9, 2009, http://www.dhs.gov/files/programs/editorial_0525.shtm.

⁶³ Tech-FAQ, *What are Symmetric and Asymmetric Ciphers?* <http://www.tech-faq.com/symmetric-asymmetric.shtml> (last visited April 8, 2010).

⁶⁴ Oracle, *The Public Key Infrastructure Approach to security*, http://download.oracle.com/docs/cd/B14117_01/network.101/b10777/pki.htm (last visited April 8, 2010).

⁶⁵ *Id.*

⁶⁶ *Id.*

⁶⁷ *Id.*

secure.⁶⁸ Then, the certificate authority must verify the identities.⁶⁹ Upon verification of the person's identity, PKI makes it very easy to determine the individual who sent the message. While it is safe to trust the credentials within the PKI system, trusting the proper establishment of identities is still a vulnerability of the system.⁷⁰ These systems are helpful for those who wish to identify themselves directly, but may not solve the problems for those who still wish to have anonymous sexual encounters.⁷¹

B. SYSTEMS TO IDENTIFY ANONYMOUSLY

Identification systems can also exist with strong identities that are also anonymous.⁷² Digital cash is one such tool that allows people to conduct transactions anonymously, but also ensure authenticity.⁷³ Currently, these systems are still susceptible to fraud because it is possible to hack into the system and alter the data regarding how much cash there is on the cards.⁷⁴ Even with these limitations, the systems are reliable enough that Hong Kong and Singapore both use active Digital Cash systems for their public transit systems.⁷⁵ While

⁶⁸ Stephen E. Blythe, *Bulgaria's Electronic Document and Electronic Signature Law: Enhancing E-Commerce with Secure Cyber Transactions*, 17 TRANSNAT'L L. & CONTEMP. PROBS. 361, 369 (Spring 2008).

⁶⁹ *Id.* at 370-371.

⁷⁰ *Id.* at 371-372.

⁷¹ See R.A. Roffman, *Continuing Unsafe Sex: Assessing the Need for AIDS Prevention Counseling*, 105 PUBLIC HEALTH REPORTS, 202, 203 (March-April 1990), available at <http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=1580060>.

⁷² Carsten Rudolph, *Covert Identity Information in Direct Anonymous Attestation*, NEW APPROACHES FOR SECURITY, PRIVACY AND TRUST IN COMPLEX ENVIRONMENTS, 443, 443-448 (2007), available at <http://www.springerlink.com/content/a885j817282p6577/fulltext.pdf?page=1>.

⁷³ Webopedia Computer Dictionary, *What is Digital Cash?* Oct. 21, 2008, http://www.webopedia.com/TERM/D/digital_cash.html.

⁷⁴ Brad Pufer, *Digital Cash*, Aug. 2002, <http://www.pbs.org/wgbh/nova/moolah/digitalcash.html>.

⁷⁵ See J. Christopher Westland, Mandy Kwok, Josephine Shu, Terence Kwok & Henry Ho, *Electronic Cash in Hong Kong*, 7 ELECTRONIC MARKETS No.2, 1997, 3, 3-6, available at http://www.electronicmarkets.org/issues/volume-7/volume-7-issue-2/v7n2_westopdf.

the concept would not directly correlate to STI verification, a tool like this to verify the authenticity of anonymous information forms the bedrock for solving this problem.

Similar to digital cash, South Africa gives a smart card to medical patients.⁷⁶ This card stores critical data for HIV health benefits that can only be unlocked with a fingerprint scan.⁷⁷ The fingerprint record is stored only on the card and not in a central database.⁷⁸ This system would be useful in a STI verification system for those who oppose a central authority maintaining their health information. As long as a private key encoded the result, known only to the trusted testing centers, the system would be able to identify fraudulent manipulation of the results. In this way, people could trust that the holder of a certain smart card had a certain status, while a central database would not contain any of the results, it would only maintain the private keys.

Systems like digital cash or South Africa's HIV benefits system could prevent STIs. For example, patrons of a sex club could get a rapid STI test and be given a card that is valid for a single visit to the club. One-time use can work because the goal is not to link to a specific person outside of the closed environment, but only to identify someone for several hours during one visit. A more secure implementation of this would change the encryption algorithm once every 24 hours, thereby making the card unreadable on future visits. The cards should also link to a certain person for that visit so that returning the card is necessary upon exit from the club in order to limit fraudulent misrepresentation. Health departments could require sex clubs to use this system and pay for it as part of the entry fee to such facilities. Using this system would ensure that the only people who would retain the information about another person's status are those whom that person has chosen to release the information to during that visit. Even if they tried to share that information without permission, they would lack proof that they are telling the truth because they would have no documentation. This is a better solution than just closing sex clubs as doing so would likely drive the

⁷⁶ USAID, *Application of SmartCard/Biometrics Technology for HIV/AIDS Anti-Retroviral Therapy in South Africa*, March 9, 2005, available at http://www.africacncl.org/hiv_aids/initiative_activities/ict_initiative/march05_presentations/panel1/JSI_DELIVER_panel1.pdf.

⁷⁷ *Id.*

⁷⁸ *Id.*

anonymous sex scene further underground making it harder to reach participants and reduce the spread of HIV.⁷⁹

V. ELEMENTS OF A SEXUALLY TRANSMITTED DISEASE IDENTIFICATION SYSTEM

A. IDENTIFICATION AND COST

A critical component is creating a method to identify, positively and securely, an individual with their test results. While identification does not need to occur by name, a pseudonym would be sufficient, it is critical that verification of their identity is reliable. The ideal identification system would use a PKI system as described above in order to securely and accurately link a person with their test results.

Biometrics presents a good solution because it provides identification systems using marks that are unique to each person. One problem is that biometric identification systems are not yet effective for all subpopulations, which can lead to many false positives and negatives.⁸⁰ Fingerprints also have some vulnerability. Specifically, fingerprints change over time due to growth or occupation. For example, the fingerprints of young people may change with age and some occupations such as bricklayers cause fingerprints to change.⁸¹ In order to reduce the concerns over these implementations, a combination of biometric and personal information is best. The National Academy of Sciences suggests a good baseline for selection of an authentication identifier: it must be unique to the system; not widely used; not be sensitive or revealing; require little or no physical contact; be obviously collected; and not relate to communication activities.⁸²

Biometrics alone, however, may not be necessary. Another method to determine the proper level of identification needed in the PKI system would be to look at other systems that need identity

⁷⁹ Daniel Mello Faissol, *et. al.*, *Role of Bathhouses and Sex Clubs in HIV and STD Transmission: Findings from a Mathematical Model*, May 11, 2006, <http://cdc.confex.com/cdc/std2006/techprogram/P11115.HTM>.

⁸⁰ *Id.* at 23.

⁸¹ *Id.*

⁸² STEPHEN T. KENT & LYNETTE I. MILLETT, WHO GOES THERE?: AUTHENTICATION THROUGH THE LENS OF Privacy 188 (2003), *available at* http://www.nap.edu/openbook.php?record_id=10656.

verification like Zipcar.⁸³ Zipcar employs RFID technology and a wireless network for verification of users.⁸⁴ Before issuing an RFID card to a user, Zipcar verifies the user's driving record.⁸⁵ Zipcar takes the chance that the eventual driver will not be the person who signed up for the smart card. This chance at deception versus the cost of a more comprehensive authentication appears to be an appropriate level of risk for the company. Although, risk taking similar to this would not be as pervasive in a STI verification system because of the ability to include personal pictures and biometric information on the result screen, risks would still exist.

Based on this risk analysis one can decide what level of security is necessary and for what cost. Sites like safesexpassport.com are not widely used because they charge up to \$300 for use of the system for just 6 months.⁸⁶ This is problematic because as much as the most technologically advanced system would be preferred for all; STIs primarily affect poor, closeted, and otherwise hard to reach communities.⁸⁷ Therefore, a tiered approach to verification levels would be the best way to protect the largest swath of people. At the most stringent level, the user would have to go through a complete identity verification process with many details, which may be similar to the process of obtaining a passport. A lesser level of verification could require encrypted information that could only be unlocked with a secret pin or fingerprint for someone who wants to retain anonymity at a bathhouse or similar venue. It would be necessary to inform people how different levels of verification affect the reliability of the verification.

Lesser levels of verification may be an acceptable risk, because even if someone has HIV, that person's ability to transmit the virus

⁸³ Zipcar is a service where a person can reserve and rent a car on an hourly basis from dispersed locations across a city that can be unlocked with only a smart card. See Zipcar, *How It Works*, <http://www.zipcar.com/how> (last visited April 8, 2010).

⁸⁴ Mary K. Pratt, *RFID: A Ticket to Ride*, Dec. 18, 2006, http://www.computerworld.com/action/article.do?command=viewArticleBasic&articleId=269126&intsrc=hm_list.

⁸⁵ *Id.*

⁸⁶ SSP Bioanalytics, *Fort Lauderdale Company to Launch "Safe Sex Passport,"* Nov. 28, 2007, available at <http://miamiherald.typepad.com/gaysouthflorida/2007/11/page/2>.

⁸⁷ Sunil Nair, *The Effect Race and Income on HIV AIDS infection in African Americans*, Dec. 12, 2007, <http://www.slideshare.net/snair/the-effect-race-and-income-on-hivaids-infection-in-africanamericans-presentation>.

depends on an individual's viral load and the type of sex that occurs.⁸⁸ Specifically, the rate of transmission of HIV can range from about a 1 in 700 to a 1 in 3,000 chance of a man contracting the virus through heterosexual sex with an HIV-positive female,⁸⁹ to about a 1 in 10 chance for a receptive partner of anal sex.⁹⁰ Therefore, even if an individual commits fraud within the system, it may be an acceptable risk because transmitting the virus to their partner is not a certainty, even if an individual is HIV-positive.

The risks for fraud over no check at all may also be acceptable because HIV is a disease that when treated properly merely decreases life expectancy and quality of life, but does not normally cause an individual to die immediately. By letting users choose the level of risk they find acceptable from mere smartcards to full identification and verification, they will have more responsibility for their choices and can better protect themselves based on what they are willing to share. No matter what technology is available, some people are not death averse and they will continue to have anonymous unprotected sex.⁹¹ This technology will not eliminate HIV transmission but can simply help insulate those people who want to have an extremely active sex life and confidence in the reliability of a partner's HIV status while minimizing their risks from those who are not death averse.

Other than fraud, individuals who lack traditional forms of identification also present the problem of linking individuals to their results, especially because those who lack traditional identification are in high-risk populations. For instance, since teenagers do not get licenses until around the age of 16, this would do nothing to help those people who are engaging in unsafe sex before the age of 16.⁹² This is important because the average age of first sexual experience in

⁸⁸ Myron S. Cohen, *HIV prevention: Rethinking the risk of transmission*, 8 IAVI REPORT, 1-4 (Sep. 2004-Nov. 2004), available at [http://www.iavireport.org/archives/2004/Pages/IAVI-Report-8\(3\)-HIV-prevention.aspx](http://www.iavireport.org/archives/2004/Pages/IAVI-Report-8(3)-HIV-prevention.aspx).

⁸⁹ *Id.*

⁹⁰ *Id.*

⁹¹ Tim Rhodes & Linda Cusick, *Accounting for unprotected sex: stories of agency and acceptability*, 55 SOCIAL SCIENCE & MEDICINE 211, 224-225 (2002).

⁹² Peter P. Swire & Cassandra Q. Butts, *The ID Divide: Addressing the Challenges of Identification and Authentication in American Society*, 12 (June 2008), available at http://www.americanprogress.org/issues/2008/06/pdf/id_divide.pdf.

America is 16.9,⁹³ and as many as one-third of teenagers are having sex before age 16.⁹⁴

This is also important because most, if not all, of the mainline dating websites do not allow users under 18 for legal reasons. In many places, it is illegal to have sex with those under 18,⁹⁵ even though most dating websites do not verify that their users are actually 18 years old or older. Acknowledging that this occurs frequently and trying to help those teenagers act safely would be a hard task to confront legally.⁹⁶ This requires society to reevaluate whether laws should change to acknowledge the fact that people under the age of 18 engage in sexual activity and need protection from STIs.

The system may have the perverse impact of actually endangering those under 18 more as they will not have results in the system. Thus, when looking for their first sexual encounter, under-age individuals may have to go to those people who do not care as much about STI status. The effect of foreclosing those most concerned about STIs from this population may put many more underage people at risk. However, creating a separate system for those under 18, accessible with parental consent, may help teach young adults to be concerned with sexual health from an earlier age and give them a more tangible tool to protect themselves than the meager sex education provided in schools today.

The economically disadvantaged, who are in higher risk categories for HIV, are also less likely to have a driver's license.⁹⁷ This means that a system reliant on photo identification will eliminate a significant population of users, who need the system most. Having a separate implementation that could be available to at risk communities at low or no cost would be preferable, even if these systems would not provide as much certainty as official government ID.

⁹³ Kinsey Institute, *Frequently Asked Questions to the Kinsey Institute*, Feb. 29, 2008, <http://www.kinseyinstitute.org/resources/FAQ.html#Age>.

⁹⁴ Elizabeth Cooksey, *Researchers Link Teen Sex to Early Friendships, Steady Dating*, Nov. 12, 2002, <http://researchnews.osu.edu/archive/yungluv.htm>.

⁹⁵ Sandra Norman Eady, *Statutory Rape Laws By State from the State of Connecticut*, April 14, 2003, <http://www.cga.ct.gov/2003/olrdata/jud/rpt/2003-R-0376.htm>.

⁹⁶ *Id.*

⁹⁷ Swire, *supra* note 92, at 13.

B. VERIFICATION AND PROTECTION OF PRIVACY

One of the paramount considerations of any identification system is protecting privacy and providing accessible, but secure verification. The system must create confidence that the results entered into the database will only be shared with those who the user chooses and will allow the user to remove their information at any time. The users must have near certainty that the results they share will be safe from replication without their consent. While sharing status presents certain risks, it is a risk that those who share their status take today, and it is a risk that individuals must be willing to take in order for the STI verification system to work. Lack of confidence in the security and privacy of the STI verification system would quickly undermine its usefulness because improper or inadvertent disclosure could cause the individual to lose a job, lose insurance benefits, or cause mental distress.⁹⁸ To address similar concerns, some credit card companies offer one-time only credit card numbers for online purchases;⁹⁹ this would be similar to the one-time only smart cards as previously suggested.

Database integrity, accuracy, and safety is also very important because no matter how good the system is, if a user can break into the central repository of the database, then the entire system will fail. However, due to the complexity of database integrity it is beyond the scope of this article to discuss database security issues.¹⁰⁰

⁹⁸ See Lambda Legal, *Fight HIV Discrimination in the Foreign Service*, <http://www.lambdalegal.org/take-action/campaigns/foreign-service/> (last visited April 8, 2010); Scott Stiffler, *Despite Laws, HIV Discrimination Continues in Workplace*, Feb 1, 2009, <http://www.edgeboston.com/index.php?ch=news&sc=&sc2=news&sc3=&id=86644>.

⁹⁹ Ina Steiner, *One Time Use Credit Cards Offer Safer Online Shopping*, Feb. 20, 2005, <http://www.auctionbytes.com/cab/abu/y205/m02/abu0137/s02>.

¹⁰⁰ See Aaron Newman, *Database Security Best Practices*, Aug. 1, 2005, http://www.securitymagazine.com/Articles/Feature_Article/5cc37c5da74d8010VgnVCM100000f932a8co_____. See also University of California at Berkeley, *Database Guidelines for Restricted Data*, Feb. 3, 2006, <https://security.berkeley.edu/DbaseGdlnsRestData.html>.

C. ACCURACY AND EDUCATION

Each testing site and database would also need a system to check the results for accuracy and quickly correct errors.¹⁰¹ The accuracy check would allow for the quick repair of false HIV positives and negatives without imposing undue burden on those injured by the errors. The process should be simpler than correcting incorrect data on one's credit report.¹⁰² A simple process for a more advanced retest and correction of the result after that test would be sufficient in most cases.

Next, the database or system must provide a guarantee to the user that the test site administrator, who vouches for the accuracy of the test results, issues the tests according to directions, and correctly matches the results to the proper person. Otherwise, those who lead risky sex lives would search out and exploit a test site that is more prone to human error or cheating. A solution to error and cheating problems could include mystery testers, inspectors who verify proper protocol, or even an EBay type rating system for test accuracy. EBay's system, gives a seller a bad rating if the product they ship is not as they described.¹⁰³ Similarly, verification could occur by giving a lower rating to a test site if someone tests negative but then subsequently tests HIV-positive, and the confirmatory test shows that the virus was likely testable and existent at the time of the last test. In this way, the system could warn a potential partner that an individual's last test may not be reliable as one from another testing center.

The need for this system may change in the future, because rapid home HIV tests lack FDA approval and currently FDA-approved clinics perform all HIV testing.¹⁰⁴ FDA-approved rapid home tests would make this HIV verification system less necessary because results would come directly from the test itself. However, a system involving FDA approved clinics may still have a higher accuracy

¹⁰¹ Swire, *supra* note 92, at 3.

¹⁰² Andrew Chan, *How to Correct Your Credit Report*, Jan. 23, 2009, http://www.boston.com/business/personalfinance/managingyourmoney/archives/2009/01/correcting_your.html.

¹⁰³ eBay, *Feedback scores, Stars, and your Reputation*, <http://pages.ebay.com/help/feedback/scores-reputation.html> (last visited April 8, 2010).

¹⁰⁴ U.S. Food and Drug Administration, *Vital Facts About HIV Home Test Kits*, Jan. 29, 2008, <http://www.fda.gov/ForConsumers/ConsumerUpdates/ucm048553.htm>.

because home testers are more likely to make an error, even though studies show this risk to be minimal.¹⁰⁵

Another very important element in an effective STI verification system is education about what the results mean. One critical piece of education relates to the potential number of false HIV positives and negatives.¹⁰⁶ The tests have up to a 99.8% accuracy rate when used correctly.¹⁰⁷ However, several conditions like storage temperature and shelf life can make the tests less accurate.¹⁰⁸ In order to give accurate tests, the FDA requires a Quality Assurance Program before offering HIV tests.¹⁰⁹ Even with this program, there are still a number of false HIV positives, and while they may be within the guidelines on the label, 30 out of 9,000 false HIV positive results are still significant.¹¹⁰ This also means that when considering the cost of administering more rapid tests, one also needs to consider the cost of more confirmatory tests at about \$40 each¹¹¹ that were not necessary before.¹¹²

When dealing with health information, false HIV positives and negatives each carry a set of risks. False HIV positives can cause a lot

¹⁰⁵ Sheldon Campbell & Roger Klein, *Home Testing to Detect Human Immunodeficiency Virus: Boon or Bane?* 44 J. CLINICAL MICROBIOLOGY, 3473–3476 (Oct. 2006), available at <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1594804/>.

¹⁰⁶ Peter Swire, *supra* note 92, at 2.

¹⁰⁷ *Kaiser Daily HIV/AIDS Report*, Jan. 13, 2006, http://www.kaisernetwork.org/daily_reports/rep_index.cfm?DR_ID=34775.

¹⁰⁸ New York State Department of Health, *Rapid HIV Testing Workbook and Implementation Guidelines for Limited Testing Facilities in New York State*, <http://www.health.state.ny.us/diseases/aids/testing/rapid/workbook.htm> (last visited April 8, 2010).

¹⁰⁹ Jeffrey Greenwald, *A Rapid Review of Rapid HIV Antibody Tests*, 8 CURRENT INFECTIOUS DISEASE REPORTS 125, 129 (2006), available at http://www.cdc.gov/hiv/topics/testing/resources/journal_article/pdf/rapid_review.pdf.

¹¹⁰ Reuters, *Clinics Using OraQuick Oral HIV Test Reporting Rates of False-Positive Results Within Limits on Label, OraSure Announces*, Oct. 22, 2005, <http://www.thebody.com/content/art9362.html>.

¹¹¹ Abigail Zuger, *Making HIV Testing Cost-Effective*, HIV/AIDS CLINICAL CARE (Dec. 11, 2006), available at <http://aids-clinical-care.jwatch.org/cgi/content/full/2006/1211/1>.

¹¹² Reuters, *Rapid HIV Test Has High False-Positive Rate*, Aug. 19, 2008, <http://www.hivplusmag.com/NewsStory.asp?ID=18573&sd=08/19/2008>.

of mental anguish, including increased suicide risk.¹¹³ There is also the risk of reputational harm and its consequences from a partner who learned these results from that partner sharing the HIV status information in a malicious way.¹¹⁴ Users must be educated to understand that they may still have or contracted HIV even if they have an initial negative test, because they might engage in even riskier practices under the auspices of a false negative than they would in the absence of such results, thereby making people vulnerable to HIV transmission.¹¹⁵

Another important aspect of education concerns what it means to be HIV positive. Some research shows that a lower viral load may result in a lowered risk of transmission to others.¹¹⁶ Some Swiss experts even have a study that shows with proper antiretroviral therapy, an undetectable viral load for several months, and without other STIs, HIV positive individuals may not be able to infect anyone.¹¹⁷ In this way, the spread of a system that also included accurate information about a HIV positive person's viral load over several months may be a very effective way to encourage those who are positive to follow their treatment closely, which may also greatly reduce the risk of transmission.

The goal of this system should not be to label people as positive or negative and then segregate them. Instead, this tool can better educate everyone as to the real risks of transmission, and make sure everyone is tested and receives the medications they need in order to reduce their risk of transmission to others.

¹¹³ *Faxed False Positive HIV Test Results Leads to Statutory Mental Anguish Claim in Florida*, Aug. 19, 2004, http://www.hollandharthealthcare.com/healthcare/2004/08/faxed_false_pos_1.html; *Abril v. Department of Corrections*, 884 So.2d 206 (Fla.App. 2Dist., 2004).

¹¹⁴ *Id.*

¹¹⁵ J.P. Dodds et al., *Increasing Risk Behaviour and High Levels of Undiagnosed HIV Infection in a Community Sample of Homosexual Men*, 80 SEXUALLY TRANSMITTED INFECTIONS, 236–40 (June 2004).

¹¹⁶ Joseph J. Eron, Jr., *HIV Transmission: The Roles of Viral Load, Oral Sex, and STD's*, Feb. 1, 2000, <http://cme.medscape.com/viewarticle/420640>.

¹¹⁷ Edwin J. Bernard, *Swiss Experts Say Individuals with Undetectable Viral Load and No STI Cannot Transmit HIV During Sex*, Jan. 30, 2008, <http://www.aidsmap.com/en/news/4E9D555B-18FB-4D56-B912-2C28AFCCD36B.asp>.

D. TIMELINESS AND EASE

Another key element is timeliness. The more time between a test and a sexual encounter means the more time for more partners since that last test. In order to reduce that gap, tests need a reasonable price, so that people can have them more frequently. By delivering results to the individual, this system will also reduce the problem of people who will not wait or return for their results.¹¹⁸ Impatience within the younger generation necessitates a new system that shortens the length of time a test takes, because a twenty-minute rapid test can currently take an hour and a half to two and a half hours, depending on counseling and various administrative tasks.¹¹⁹ This new HIV verification system would instead deliver the information in a much more expedient and user-friendly way, without a return to the testing site or lengthy waiting time at the facility.

This would also create a system with more ease for those who want more privacy. For example, the gay community supports a large number of HIV testing clinics, which may make it an awkward place to go for an individual who does not want others to believe he has sex with other men. By increasing the amount of HIV tests being performed a year, it would become more cost-efficient to disperse the HIV testing sites to many more local community clinics which could increase the comfort level for certain individuals to get tested. While these additional clinics could exist today, without the STI verification system, there is not a reason to test more often. First, many partners will not ask about another's results. Second, individuals cannot verify the results of their test. This cycle of confusion, however, may change with a widely used STI verification system.

By increasing the availability, ease, and reliability of this testing, a new STI verification system could change the social acceptability and fear of being tested.¹²⁰ An increased social reliance on this system might also encourage more people to share their results by providing

¹¹⁸ Jeffrey L. Greenwald, et al., *A Rapid Review of Rapid HIV Antibody Tests*, 8 CURRENT INFECTIOUS DISEASE REP. 125, 129 (2006), available at http://www.cdc.gov/hiv/topics/testing/resources/journal_article/pdf/rapid_review.pdf.

¹¹⁹ Centers for Disease Control, *Counselor Perceptions and Impression of HIV Counseling Using a Rapid HIV Test Respect- 2*, <http://www.cdc.gov/hiv/topics/research/respect-2/bibliography/ppt/CounsImpressions.ppt> (last visited April 8, 2010).

¹²⁰ 10 Reasons to Test for STIs, POSITIVELIFENSW, 2006, <http://positivelife.org.au/factsheet/15>.

social incentives for being tested.¹²¹ Increased levels of testing can reduce the level of new STI cases, because many STIs with proper treatment have a reduced risk of transmission to others.¹²² Sharing these results might even lead to less drug use and depression as real numbers of those infected become more apparent, and infected people can better understand that they are not alone.¹²³ Providing better accessibility to STI information will increase awareness of the prevalence of these issues, and might help change the minds of those who have moral reservations about safe sex education.¹²⁴

VI. WHO WOULD BEAR THE TORT LIABILITY?

A. PERSONAL LIABILITY

There are several torts available for those who contract STIs. These are negligence, fraudulent misrepresentation, intentional infliction of emotional distress, and battery.¹²⁵ Thirty-two states make knowing HIV transmission a crime.¹²⁶ In fact, transmission of a sexual disease is a felony in Oklahoma.¹²⁷ Courts today tend to make case-specific analyses into whether a duty of care exists to inform a sexual partner of one's status.¹²⁸

¹²¹ Howard E. Gendelman et al., *The Neurology of AIDS*, 759 (2d ed. 2005), available at <http://books.google.com> (search "Search Books" for "The Neurology of Aids;" then follow "The neurology of AIDS" hyperlink).

¹²² Derek Thaczuk & Michael Carter, *Antiretroviral Treatment Lowers Rates of HIV Transmission in Heterosexual Couples in Africa*, Feb. 10, 2009, <http://www.aidsmap.com/en/news/EE59A107-93DF-4B9B-AE5E-5E86DF018B41.asp>.

¹²³ Richard Knox, *Many Americans With HIV Don't Know They Have It*, Nov. 24, 2008, <http://www.npr.org/templates/story/story.php?storyId=97315837>.

¹²⁴ *Id.*

¹²⁵ Legal Match, *Liability for Transmitting a Sexually Transmitted Disease*, <http://www.legalmatch.com/law-library/article/liability-for-transmitting-a-sexually-transmitted-disease.html> (last visited March 12, 2010).

¹²⁶ American Civil Liberties Union, *Criminal Statutes on HIV Transmission*, June 4, 2008, http://www.aclu.org/files/images/asset_upload_file292_35655.pdf.

¹²⁷ Deana Pollard-Sacks, *Sex Torts*, 91 MINN. L. REV. 769, 808 (2007) available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=783464.

¹²⁸ *Id.* at 796.

An online site for verification of STIs could change the way these laws work. If people refused to use the technology to verify a partner's status, they might lose the right to sue. Such an approach could help to prevent people who are HIV-positive from lawsuits even though the other person assumed the risk. Knowledge of one's HIV status would no longer subject a person to increased liability and this could make people more willing to learn their own HIV status.

Currently, physicians also have an ethical obligation to inform third parties when they are aware that an HIV-positive patient is going to engage in sex with someone else and is planning not to inform that other person.¹²⁹ The system proposed above could reduce some of the liability on physicians because the tools would be easy to use and those who failed to use them would bear more responsibility for their own health choices.

Some argue that transmission of sexual diseases should subject the transmitter to strict liability.¹³⁰ Others agree with Deanna Pollard's statement that, "[i]n the sexual disease context, the parties are often unable to negotiate fairly over who should bear the risk of loss, because they lack information. In a sense, an information defect is present when neither party is aware of the disease."¹³¹ Closing the information gap, by encouraging more frequent testing and checking, is exactly the goal of this system. In this way, there will not be a need for new sexual strict liability torts because those who do not participate in the system will be assuming their own risks, which would exclude them from recovery because they made a reckless decision. In today's system, with incomplete information, it does not seem fair to implement a system of sexual strict liability torts, when even getting a rapid test can become a tedious multi-hour process.¹³²

B. SYSTEM LIABILITY

The Health Insurance Portability and Accountability Act ("HIPAA") provides regulations on privacy that could make it complicated to implement this system because of its restrictions on

¹²⁹ Thomas Bradley et al., *Legal Issues Associated With Disclosure of Patient's HIV Positive Status to Third Parties*, American Academy of HIV Medicine (Summer 2002), <http://www.thebody.com/content/art33211.html>.

¹³⁰ Pollard-Sacks, *supra* note 127, at 770.

¹³¹ *Id.* at 808.

¹³² Swire, *supra* note 92.

sharing personally identifiable health information.¹³³ The first step in determining HIPAA coverage is to determine if the STI verification system would qualify as one of the covered entities of: health care provider, health care clearinghouse, or health plan.¹³⁴ The HIV testing center would likely be a provider and the verification system might be a clearinghouse.¹³⁵ However, pursuant to HIPAA, if a testee were to give written authorization for sharing of their results, the registry would be able to release the results legally to the system, which in turn could release it to their chosen partners.¹³⁶

There would be massive potential liability if the consent was out of date or if the privacy terms of the website changed without the express informed consent of the users. HIPAA violations can range from \$100 per violation with an annual maximum of \$25,000 for violations where an individual reasonably did not know they were violating HIPAA to \$50,000 per violation with an annual maximum of \$1.5million for violations with more neglect.¹³⁷ In order to prevent potential liability, the consent forms would need to be very detailed but easy to understand regarding who might see this information, so that there are no surprises. This could be difficult to implement and may be part of the reason why some of the existing sites merely removed the profiles of HIV positive members instead of dealing with the consent issues of sharing that status. As guidance, a list of standards, like the list for Public Health Departments when dealing

¹³³ University of Miami, Privacy/Data Protection Project, *Consent (HIPPA)*, http://privacy.med.miami.edu/glossary/xd_consent.htm (last visited April 8, 2010).

¹³⁴ *Covered Entity Charts*, 2, <http://www.cms.hhs.gov/HIPAAgenInfo/Downloads/CoveredEntitycharts.pdf> (last visited April 8, 2010).

¹³⁵ See *A Resource Guide for HIV Services Providers and Health Resources and Services Administrations HIV/AIDS Bureau Staff*, April 2004, <http://hab.hrsa.gov/publications/hippa04.htm>.

¹³⁶ Columbia University Medical Center, *Uses and Disclosures of HIV/AIDS Information*, <http://www.cumc.columbia.edu/hipaa/policies/hiv.html> (last visited April 8, 2010).

¹³⁷ American Medical Association, *HIPAA Violations and Enforcement*, <http://www.ama-assn.org/ama/pub/physician-resources/solutions-managing-your-practice/coding-billing-insurance/hipaahealth-insurance-portability-accountability-act/hipaa-violations-enforcement.shtml> (last visited April 8, 2010).

with STI prevention on the Internet,¹³⁸ could exist for STI verification sites to help avoid liability.

It is also possible that this service will not fall under HIPAA, depending on its exact design, because HIPAA applies differently depending on how information is stored. For instance, HIPAA does not apply to Google Health because it does not store the data on behalf of the health care providers, but instead merely stores the records for the users who have a right to request the information.¹³⁹ Much like Google Health, the system could reduce some of its potential liability by having a person release their results to it.

In 2009, as part of the America Recovery and Reinvestment Act of 2009, the list of organizations covered by HIPAA expanded.¹⁴⁰ Google and Microsoft maintain that this still does not apply to them because they interact directly with the consumer and are not a business associate of the hospital.¹⁴¹ The issue seems to turn on whether the services add value for the consumers or for the health care providers themselves.¹⁴² The ability of Google Health to avoid HIPAA coverage at this point is instructive because the information stored in the STI identification system would only be one result or one set of results, not someone's entire medical record. In this way, this system actually raises fewer privacy concerns than Google Health does. Even with the reduced privacy concerns, this STI identification system should have stricter privacy requirements than those required under HIPAA in order to encourage widespread use of the system.

One major obstacle to participation in this system would be that currently 43 states require that testing centers report HIV results to

¹³⁸ National Coalition of STD Directors, *National Guidelines for Internet-Based STD and HIV Prevention: Accessing the Power of the Internet for Public Health* (March 2008), available at <http://www.ncsddc.org/upload/wysiwyg/documents/IG-FINAL.pdf>.

¹³⁹ Google, *Google Health and HIPAA*, <http://www.google.com/intl/en-US/health/hipaa.html> (last visited April 8, 2010).

¹⁴⁰ Neil Versel, *HIPAA Expands to Personal Health Records – Just Not Google's or Microsoft's, If You Ask Them*, April 7, 2009, <http://industry.bnet.com/healthcare/1000480/is-google-above-the-law>.

¹⁴¹ Vince Kuraitis, *Privacy Law Showdown? Legal and Policy Analysis*, April 21, 2009, <http://e-caremanagement.com/privacy-law-showdown-legal-and-policy-analysis>.

¹⁴² *Id.*

state health authorities.¹⁴³ This rule needs altered for the most effective use of this system, because while sharing results with a sexual partner is one issue, giving them to the government is a greater concern. State governments do not always follow proper privacy procedures¹⁴⁴ and malicious sharing of HIV data is very possible. This lack of trust in what the government may do with the information may keep those who do not want the government involved in their life from participating in a STI verification system.

Leaked information and information shared without the owner's consent is another area for potential liability. Several lawsuits are currently active against sites who have leaked nude photos of their members.¹⁴⁵ Moreover, the Wisconsin Bar Association advises that telling other people another person's results without that person's consent may be cause for a lawsuit.¹⁴⁶ This is why the system must have safeguards to verify that users are intending to share the information at a given time, and limit the amount of access to results without verification from the user, within that given time.

Another area of potential liability is suing these existing sex sites for negligence over the spread of STIs much in the same way that some try to sue cigarette companies over the health risks associated with smoking.¹⁴⁷ Negligence requires a duty of care, breach of that duty, causation, and harm.¹⁴⁸ The adult entertainment industry in an effort to reduce its liability from this sort of liability and in an effort to reduce their performers from contracting STIs has guidelines that require valid STI tests. Specifically, the adult entertainment industry

¹⁴³ Hilary Oswald, *New Federal HIV Testing Protocols Unveiled*, Nov. 1, 2006, http://www.heartland.org/policybot/results/19981/New_Federal_HIV_Testing_Protocols_Unveiled.html.

¹⁴⁴ Associated Press, *Strickland: Data on Stolen Device are Needed*, YOUNGSTOWN VINDICATOR, June 17, 2007, available at http://www4.vindy.com/content/national_world/322335758371957.php.

¹⁴⁵ Bil Browning, *PR 101: Dustin Lance Black Lawsuit Over Leaked Sex Pics*, HUFFINGTON POST, Aug. 5, 2009, http://www.huffingtonpost.com/bil-browning/pr-101-dustin-lance-black_b_252208.html.

¹⁴⁶ State Bar of Wisconsin, *HIV and Your Rights: A Legal Guide to Wisconsin*, <http://www.wisbar.org/AM/Template.cfm?Section=Home&CONTENTID=47422&TEMPLATE=/CM/ContentDisplay.cfm> (last visited April 8, 2010).

¹⁴⁷ Matt Smith, *Cruise Control*, SF Weekly, April 8, 2008, available at <http://www.sfweekly.com/2008-04-09/news/cruise-control>.

¹⁴⁸ *Negligence*, <http://www.answers.com/topic/negligence> (last visited April 8, 2010).

requires that the Adult Industry Medical Healthcare Foundation does the testing and that the tests originate from within the past month.¹⁴⁹ The PCR DNA test they use, that tests for the virus itself instead of for the antibodies like a standard HIV test,¹⁵⁰ can identify a positive result as early as 9 days after exposure.¹⁵¹ By requiring use of these advanced tests, adult entertainment studios limit their liability for breach of duty of care much in the same way adult hookup websites could limit their liability by using a STI verification system like the one suggested. Conversely, any site that would also encourage unprotected sex based on the reliability of the system may expose itself to liability for overstating the effectiveness of its tests and become the legal cause for the transmission of the STI.

There may also be potential legal liability if a batch of rapid at home tests failed. With this system, in-person, trained, testing means easier reinforcement of the importance of these risks and education about the accuracy of the tests, even if only in minimal ways. This education would help reduce court cases for negligence for failing to meet the duty of care as the testing sites, working in conjunction with the website, could utilize multiple paths of education to prove that they did not breach the duty of care to provide complete information about test accuracy to their users.

Legal problems could be worse for this system than just having rapid at home tests because states may try to sue for access to the records in order to prosecute crimes involving STI transmission under the statutes described earlier in this article. For instance, the state of California subpoenaed the records of the Adult Industry Medical Healthcare Foundation.¹⁵² Michigan, in the recent past, even released the HIV-positive status of an arrested man without his consent.¹⁵³

¹⁴⁹ Matt Siegel, *Business Before Pleasure?*, The Advocate, Aug. 16, 2009, available at <http://www.advocate.com/printArticle.aspx?id=95221>.

¹⁵⁰ Adult Industry Medical Healthcare Foundation, *HIV/AIDS*, October 6, 2007, <http://www.aim-med.org/library/articles/1194375471/>

¹⁵¹ *Id.*

¹⁵² Jason Schossler, *Porn Star Says State Violated Her Privacy Over HIV Test Results*, Aug. 12, 2009, http://news.findlaw.com/andrews/h/hea/20090807/20090807_patientzero.html.

¹⁵³ Todd A. Heywood, *Attorney General's Ruling on HIV Disclosure Prompts Medical Privacy Worries*, Sep. 9, 2009, <http://michiganmessenger.com/25797/attorney-generals-ruling-on-hiv-disclosure-case-prompts-medical-privacy-worries>.

Several states are also using GPS to track sex offenders,¹⁵⁴ and California recently joined other states by moving to an HIV tracking system that tracks people by name instead of alphanumeric codes.¹⁵⁵ Based on these examples, fear of states misusing this data is justified. This potential for misuse requires stronger state privacy statutes to protect those who wish to disclose their STI results with others, but do not want the state to receive the data. This may mean that the most effective use of this technology would be for single use HIV test results, where the results are stored only for the night and then deleted from the system so that the government or other malicious parties can never access the data.

VII. INVESTING IN THIS SYSTEM MAKES FINANCIAL SENSE

An STI verification system provides tangible social and economic benefits, because of the costs associated with HIV. Studies show that approximately 20% of those infected with HIV between the ages of 25-64 do not have any health insurance.¹⁵⁶ This is extremely costly for states, as Ohio has shown by spending in a single year: \$1.6 million for HIV medications in prisons; \$14.6 million for social services to the infected poor; and \$42.5 million to pay for HIV drugs and treatment, home health care, and nursing home beds.¹⁵⁷ While the technological solutions suggested by this article may be politically controversial, due to the extraordinary costs of HIV treatment, they make economic sense.

Even for those who can pay, treatment for an HIV positive person averages \$25,200 a year.¹⁵⁸ During the average 24-year life expectancy of an HIV positive person, treatment can equal over

¹⁵⁴ Hannah Sentenac, *More States Move to Use GPS Tracking of Sex Offenders*, May 31, 2006, <http://www.foxnews.com/story/0,2933,196455,00.html>.

¹⁵⁵ Charles Ornstein, *Assembly Agrees to Update HIV Tracking*, LA TIMES, March 31, 2006, available at <http://articles.latimes.com/2006/mar/31/local/me-hiv31>.

¹⁵⁶ Committee on the Consequences of Uninsurance, *Care Without Coverage*, 164, (2002), available at http://books.nap.edu/openbook.php?record_id=10367&page=164.

¹⁵⁷ Margaret Newkirk & David Knox, *Prison's Hidden Cost*, AKRON BEACON JOURNAL, Mar. 17, 2002, available at <http://www.prisonpolicy.org/scans/AkronBeaconJournal03172002.shtml>.

¹⁵⁸ Associated Press, *AIDS Patients Will Spend \$600k for Care*, Nov. 10, 2006, <http://www.msnbc.msn.com/id/15655257/>.

\$600,000.¹⁵⁹ Yet, a rapid test averages only about \$7, and a more extensive confirmatory test only averages about \$40.¹⁶⁰ The accuracy for these tests if the virus is present is greater than 99.5%.¹⁶¹ However, a window of three weeks to three months exists before the test can detect the antibodies in the blood if someone is newly infected.¹⁶² Even with this downside, the cost of just one person's treatment for a year could test 30 individuals in the highest risk categories every month for 10 years. With an HIV verification and identification system, the reduction in the amount of infected individuals and consequent savings would easily make the system pay for itself.

Although the cost savings associated with lowered transmission rates would be great, PKI is still expensive and may be more expensive than the testing itself. Traditional in-house and outsourced PKI systems can cost between \$81 and \$420 per user, per year based on a system with 1,000 users.¹⁶³ A new method of PKI, called Server Side Signing, uses existing user information and can reduce costs but would have an initial high cost for setup around \$90 a user, but would then decrease to \$15 a user in subsequent years based on a system with 1,000 users.¹⁶⁴ The costs for both types of PKI go down as more users join the system; for instance, the \$81 cost per user at 1,000 users can drop to \$33 with 10,000 users,¹⁶⁵ at 50,000 users the cost

¹⁵⁹ *Id.*

¹⁶⁰ Abigail Zuger, *Making HIV Testing Cost- Effective*, HIV/AIDS Clinical Care, Dec. 11, 2006, available at <http://aids-clinical-care.jwatch.org/cgi/content/full/2006/1211/1>.

¹⁶¹ Centers for Disease Control and Prevention, *FDA-Approved Rapid HIV Antibody Screening Tests*, Feb. 4, 2008, <http://www.cdc.gov/hiv/topics/testing/rapid/rt-comparison.htm>.

¹⁶² New York State Health Department, *FAQ's Concerning Rapid Testing for HIV*, <http://www.health.state.ny.us/diseases/aids/testing/rapid/faqs.htm> (last visited March 12, 2010).

¹⁶³ Cosign, *Digital Signatures and the Hidden Costs of PKI*, Nov. 2008, available at <http://www.scribd.com/doc/9768012/Digital-Signatures-and-the-Hidden-Costs-of-PKI>; Verisign, *TCO for PKI Whitepaper*, Feb. 2002; Entrust, *Why Outsourcing Your PKI Provides the Best Value*, July 2009, available at http://download.entrust.com/resources/download.cfm/23826/Entrust-Managed-Services-PKI_TCO.pdf/?start.

¹⁶⁴ *Id.*

¹⁶⁵ Verisign, *supra* note 163.

could drop to under \$10 per user.¹⁶⁶ As the system grows, adding a user to the system could cost roughly as much as a rapid test costs per user. For less than the cost of one year of HIV medications for prisoners in Ohio, the PKI infrastructure for this system could be set up in all of the highest risk communities in several states, if not nationwide, depending on the method chosen.

By increasing the quantity of rapid HIV tests, and creating a space to share the results, economies of scale and competition would be sure to drive down the price even further. The accuracy and speed of these tests alone is already starting a trend of shortening the window between tests in Seattle, San Francisco, Denver, and the District of Columbia.¹⁶⁷ In those cities, the average interval between HIV tests has dropped to under 300 days for men who have sex with men.¹⁶⁸ This system could drop this interval further and could transform the spread of HIV in America, by marginalizing those who refuse to use the system, and creating stronger communities for those who have HIV.¹⁶⁹

VIII. CONCLUSION

The resurgence of STIs, especially HIV, threatens to cost billions of dollars and adversely affect millions without new approaches. Not everyone will participate in a STI verification system, and vulnerabilities would still exist for fraud and misuse. However, today's process of trusting someone's representation of their STI status is unreliable and individuals consistently make sexual decisions based on inadequate information.

Tools are already available to create a system that can better protect individuals and raise the visibility level of STIs. It is irresponsible not to use these technologies more widely. Once a

¹⁶⁶ Entrust, *supra* note 163.

¹⁶⁷ Donna Helms et al., *HIV Testing Frequency Among Men Who Have Sex with Men Attending Sexually Transmitted Disease Clinics is Declining*, 50 JOURNAL OF ACQUIRED IMMUNE DEFICIENCY SYNDROMES, 320, 320-26 (March 2009), available at http://journals.lww.com/jaids/Abstract/2009/03010/HIV_Testing_Frequency_Among_Men_Who_Have_Sex_With.12.aspx.

¹⁶⁸ *Id.*

¹⁶⁹ J. Grierson, *Memberships and Alliances: The Importance of Community Identifications for Health Maintenance in a HIV Positive Cohort in NSW*, Dec 9-11, 1999, <http://gateway.nlm.nih.gov/MeetingAbstracts/ma?f=102242873.html>.

system with sufficient privacy is operational and reliable, the legislature should require that different hookup and relationship websites, and sex clubs, use this system. This new testing system even has the potential to change the handling of sexual torts. Instead of liability resting on doctors or those who knowingly infect others, it shifts the responsibility to those who are irresponsible in their avoidance of STIs.

It is uncertain if this system will reduce overall STI transmission through knowledge and higher rates of adherence to HIV medication regimens, or increase it, because people will be more reckless. However, to not attempt to allow people to make decisions about their own sex life with as much information as possible is a reckless choice that should end soon. The emergence of a system like this may not solve the epidemic, but it is a cost effective way for those who are concerned about their health, to obtain more sanity in the emerging world of Internet dating where it is just not possible to know how much to trust your next sexual partner with your health.

